

**IN THE CLAIMS:**

1           1.       (Currently Amended) A cathode block for aluminum refining with 15 ~~[[--]]~~ to  
2   100 wt % of calcined coke, characterized in that the calcined coke is prepared by coking and  
3   calcining after mixing heavy crude oil containing 10 ~~[[--]]~~ to 25 wt % of quinoline insoluble with  
4   3 ~~[[--]]~~ to 20 wt % of carbon black.

1           2.       (Currently Amended) ~~[[A]]~~ The cathode block for aluminum refining according  
2   to claim 1, wherein the heavy crude oil is coal tar pitch.

1           3.       (Currently Amended) ~~[[A]]~~ The cathode block for aluminum refining according  
2   to claim 1, wherein the heavy crude oil contains quinoline insoluble at 15 ~~[[--]]~~ to 20 wt %.

1           4.       (Currently Amended) ~~[[A]]~~ The cathode block for aluminum refining according  
2   to claim 1, wherein the average particle diameter of the carbon black is more than 10 nm.

1           5.       (Currently Amended) ~~[[The]]~~ A manufacturing process of a cathode block for  
2   aluminum refining by adding binder pitch to the mixture of 15 ~~[[--]]~~ to 100 wt % of calcined coke  
3   and 0 ~~[[--]]~~ to 85 wt % of carbonaceous material, and then kneading, forming, baking and  
4   graphitizing, wherein the calcined coke is prepared by coking and calcining after mixing heavy  
5   crude oil containing 10 ~~[[--]]~~ to 25 wt % of quinoline insoluble with 3 ~~[[--]]~~ to 20 wt % of carbon  
6   black.

1           6.       (New) The cathode block for aluminum refining according to claim 1 wherein the  
2   bulk density is less than 1.62 g/cm<sup>3</sup> and the specific resistivity is greater than 13 μΩm.

1           7.       (New) The cathode block for aluminum refining according to claim 1 wherein the  
2 cathode block is graphitized.

1           8.       (New) The cathode block for aluminum refining according to claim 7 wherein the  
2 cathode block is formed into a cylinder shape.

1           9.       (New) The cathode block for aluminum refining according to claim 8 wherein the  
2 abrasion is less than 33% in volume when rotated in an alumina particle slurry at 240 rpm for a  
3 period of four hours.

1           10.      (New) A method of manufacturing a cathode block for use in aluminum refining  
2 comprising the steps of:

3                    calcining a coke pre-form having a mixture of a heavy crude oil containing 10 to  
4 25 wt % of quinoline insoluble and a carbon black, the carbon black being 3 to 20 wt % of the  
5 mixture;

6                    crushing the calcined coke pre-form;

7                    mixing the crushed calcined coke with a binder pitch and carbonaceous material;

8                    forming a block of the mixture of calcined coke, carbonaceous material and  
9 binder pitch;

10                  baking the block of calcined coke, carbonaceous material and binder pitch at a  
11 temperature between 800° to 1300° C for at least 10 hours; and

12                  graphitizing the baked block at a temperature between 2400° to 3000° C for at  
13 least 5 hours.

1           11.   (New) The method of manufacturing of claim 10 further including cutting the  
2 cathode block into a cylinder.

1           12.   (New) The method of manufacturing of claim 10 wherein the mixture of crushed  
2 calcined coke, binder pitch and carbonaceous material is kneaded at a temperature in the range of  
3 120° C to 150° C before being formed into a block.

1           13.   (New) The method of manufacturing of claim 10 wherein calcining is performed  
2 at a temperature range of 1300° C to 1500° C for a time period of 1 to 3 hours.

1           14.   (New) The method of manufacturing of claim 10 wherein the carbon black is  
2 within a range of 3 to 5 wt % and the quinoline insoluble is within a range of 15 to 20 wt %.

1           15.   (New) The method of manufacturing of claim 14 wherein an average particle  
2 diameter of the carbon black is between 10 nm and 100 nm.

1           16.   (New) The method of manufacturing of claim 15 wherein iodine adsorption is  
2 less than 100 mg/g of carbon black.